

THE macdonald JOURNAL

JUNE 1977



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Cover: for an article on the feeding of dairy cattle, see the Family Farm section. Photo courtesy Quebec Ministry of Agriculture.

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Journal Jottings

As a result of discussing the article in this issue entitled "The Effective Care and Operation of the Grain Combine" with the author Professor Norris, I have already scheduled an article for July, 1978, which is, indeed, advanced planning.

I felt I should concentrate on cereal grains in this article," Professor Norris explained, "otherwise I would have taken up your entire issue! However, when time permits there is a great deal more that I would like to cover." He will, next year, in time for corn harvesting. Meanwhile his present article is packed with good, solid information which we

hope will help you obtain maximum results from this vital and expensive piece of farm machinery.

We received another article in a somewhat similar way. Having completed the interview with Professor McKyes and Rudi Dallenbach on "Soil Compaction", which was published in an earlier issue this year, a casual comment of "what else is new?" brought us "New Developments in Liquid Manure Injectors." The Department of Agricultural Engineering have come up with a new design for a liquid manure injector; how they arrived at this design makes for interesting reading.

As with all other articles, I have already read "Weeds as Indicators of Soil Conditions" three times, and as it goes through the printing process I will read it at least twice more. I thoroughly enjoyed it the first time and will read it with just as much enthusiasm the fifth time round. It is an article that I think will appeal to all ages and all occupations. I have a feeling that you, too, will find yourself going back for just one more glance.

Hazel M. Clarke

Over the past year, the Extension Department of Macdonald College has developed a system of information, teaching, and extension services specifically designed to meet the needs of people who are without daily access to the university. Through the extension of the college resources, this philosophy of a strong commitment to involvement in communities has been one of the major emphases of Macdonald College since its founding in 1905 by Sir William Macdonald. The ideas of service to the public and strong community-university links were priorities in Sir William's efforts to improve the overall quality of rural life.

This noble purpose has not diminished but instead has amplified since its inception — the Macdonald presence in agriculture spreads not only over Quebec but outward to national and international levels as well. The future

of this modest institution is assured through a strong commitment from the university and the support from the community at large. Its contribution to solving problems in today's modern agriculture will continue to be its primary concern and its *raison d'être*; the continued accessibility of its research staff, experimental farm, and extension staff gives it a unique relationship in the framework of Quebec's plural society. Since most of Macdonald's services and information are bilingual, it thus occupies an important role in Quebec's evolution. This effort has to be continued at an increasing rate because the demands from both the anglophone and francophone populations are increasing. It has been possible to maintain and expand extension services over the past years by developing cooperative relationships with federal and provincial governments, agribusiness, farm and rural organizations — our most

important contacts are with people. If we are serious about solving today's problems and helping to develop tomorrow's agricultural operating models, the emphasis will have to be geared to improving the cooperative relationship between all interests in agriculture at all levels.

Both government and the university have often turned deaf ears to the pleas of their extension staff who work assiduously to establish that important communication link between the college and the community. However, it is our conviction that by continuing our efforts to extend the resources of the university to the community, both government and the university will come to the realization that this is not only the founder's dream but has contributed greatly towards the justification and the existence of our institution in our society. Martin van Lierop

New Dean Appointed

Macdonald College welcomed a new Dean this month, one who is no stranger to this Campus. Dr. Lewis E. Lloyd succeeded Dr. A. Clark Blackwood as Dean of the Faculty of Agriculture and Vice Principal of Macdonald College on May 31, 1977.

Dr. Lloyd received his Bachelor of Science in Agriculture at Macdonald and went on to earn his M.Sc. and Ph.D. here as well. Dr. Lloyd then joined the Macdonald Faculty, eventually becoming Chairman of the Department of Animal Science, a post he held for seven years. He then went to the University of Manitoba where he is now Dean of the Faculty of Home Economics. While at Macdonald, Dr. Lloyd co-authored the textbook "Fundamentals of Nutrition" with Dr. Earle E. Crampton. Nutrition remains a major academic interest of Dr. Lloyd's to this day.

Dr. Blackwood will take a year's sabbatical leave at the University of Victoria in British Columbia, returning to Macdonald in 1978. He frankly admits that it is "kind



Dr. Lewis E. Lloyd

of a relief" to return to teaching. He says that he missed the student interaction that is so much a part of teaching at the University level, and he also welcomes the opportunity to become actively involved in research again. While Dean, Dr. Blackwood was most satisfied to see the large increase in enrollment at Macdonald — student numbers doubled over the last four years. He predicts that the Faculty of Agriculture and School of Food

Science will continue to "hold their own" in the foreseeable future, in spite of the anticipated decrease in overall university enrollments.

Dr. Blackwood feels that there is a very good future for agricultural graduates, citing the wide variety of opportunities open to them. He is also looking forward to the occupancy of the new Macdonald Stewart Building, saying that the Faculty being housed under one roof will have a beneficial effect. He feels that ties between the staff and post-graduate students of the various departments will be reinforced, due to the closer physical proximity.

Macdonald traditionally refers to past eras as having been the "property", so to speak, of the then-current Dean. For example, the "Dion Years" of 1955-1971. With the end of the Blackwood Years and the beginning of the Lloyd years, the Journal wishes to thank the outgoing Dean for his efforts on behalf of Macdonald College in the last five years and to welcome the new Dean to the Campus. We wish them both the best in the future.

Effective Care and Operation of the Grain Combine

by Professor Eric Norris,
Department of Agricultural
Engineering

One of the most complex and most important pieces of equipment on a farm where cereal grains are harvested is the grain combine. Like the old stationary thresher which it replaced earlier in this century, this machine can be relatively trouble-free during the harvest season if properly maintained, but can be the source of endless headaches when its care has been inadequate. The purpose of this article is to outline at least some of the steps which a farmer can take to help insure a speedy, effective, and profitable harvest.

Post-Harvest Care — Preparation for Storage

Preparations for this year's harvest should have begun the day after you finished last year's harvest. It is not sufficient to put the machine in its appointed space in the storage shed and walk away, expecting it to start operation the next year with no trouble.

If it is a self-propelled machine, the engine requires some preparation for storage. Rather than leaving that worn-out oil in the crankcase, perform an oil and filter change and run the engine for a few minutes to get the new lubricant thoroughly circulated through the engine parts.

If the cooling system is filled with permanent antifreeze, use a hydrometer to check that it will withstand the lowest expected temperature for your region. If the cooling system is filled with water, drain it and flush with a rust inhibitor solution. Make sure that

all necessary plugs are opened to thoroughly drain the cooling system. It is best to hang a "no water" sign on the steering wheel after you have drained the cooling system.

If it is a spark ignition engine, it is a good idea to pull all the spark plugs, squirt some oil in through the apertures, and turn the engine over a few times to work the oil down the cylinder walls. A similar procedure can be performed by removing the injectors of a diesel engine.

A spark ignition engine should have the entire fuel system drained before storage; otherwise, you are likely to have some carburetor difficulties when you try to start it next year. In any event, it is a good time to take a look at your service chart to see whether you should order the parts for an ignition tune-up or, in the case of a diesel engine, make an appointment for an injector and pump service next spring.

Plug the intake and exhaust of the engine to keep out moisture, remove the battery and store it in a cool, dry place, and the engine should be safe for the winter.

A rather mundane but important post-harvest operation is cleaning the machine. Simply go around the machine and remove all piles of dust, chaff, dirt, etc., from the outside of the machine. Also, check such places as the bottom of grain elevators and augers for grain, chaff, and debris. These are excellent places for moisture to gather and start a rust problem.

Check over the hydraulic system. If there are frayed hoses or bad connections, start a list of parts to take to the dealer the next time

you go to town. He will be very happy to send in an unhurried order for you.

If your shed has an earth floor, block up the header so that it is not resting on damp soil. While you are at it, you might consider jacking up all axles and blocking them up as well. You might just get a year or two more out of those expensive tires.

Regarding drive components, it is best to remove all of the drive chains, clean them in a suitable solvent and leave them soaking in oil over the winter. At the very least, make sure that they get a thorough oiling even if you do not take them off the machine. While looking at the chains, check over the sprockets and add the worn sprockets that you see to your list of parts to take to the dealer. Drive belts should be loosened and the tension released from all of the slip clutches. Again, if you see any questionable belts, add them to your list.

Remove the knife from the cutter bar and store it in a place where it will remain straight. Any parts of the knife or cutter bar which are shiny should be oiled. Otherwise, you will experience some cutterbar clogging problems next year while the rust is being worn off.

Although it is not essential for the storage of the machine, it is a good opportunity to check components such as bearings, sheaves, elevator chains, slats, housings, etc., for excessive wear. Should you find any parts needing replacement, add them to your list.

When your order of parts comes in during the winter, you may

actually find some spare time to fix up some of the things that you noted. This will take the pressure off when it gets close to harvest time.

Pre-Harvest Care

It may seem that you just finished seeding, but it is already time to start thinking about putting the combine into shape for harvest. Let us start at the front of the machine and work back through it along the path that the crop will follow.

Find the knife that you stored last fall and get it sharpened. If the knife has been sharpened too many times and the sections are pretty badly worn back, then it is time for a complete replacement of sections. If the sections are top-serrated, and the serrations are getting very dull, then it is time for a new knife or new serrated sections. Install the knife in the cutter bar and make the following adjustments: (1) Check the knife register. The knife is in proper register if the sections are centred in the guards at the ends of the stroke. (2) Adjust the wear plates at the rear of the knife. The knife should be supported evenly on its back edge by these wear plates. (3) Check the adjustment of the hold-down clips. They should be bent down just tight enough so that the knife does not bind but performs a nice scissors action between the sections and the ledger plates.

If you swath your grain and use a pickup, check over the teeth on the pickup assembly. Replace and repair any bent or broken teeth.

Check over the reel assembly for loose bolts and bent or broken slats. Now is the time to tighten these things up. If you have a pickup reel, broken and bent reel tines should be attended to.

Check the table auger and fingers for any problems. Bends and nicks on the edge of the auger flights

can be a source of wrapping problems. If the fingers are badly worn, it may be time to replace the finger assembly.

The next point to look at is the feeder elevator. Assuming that you have repaired or replaced any damaged slats, the tension on the chain should be adjusted so that the slats just touch the bottom of the elevator housing as they move up the slope.

The heart of the combine is the cylinder concave assembly. Check it over rather thoroughly for wear, bends, and any other damage. If the cylinder and concave bars are badly worn, you may consider replacing them. It is unwise to replace only one cylinder bar; the new bar will cause over-threshing whereas the old bars will cause under-threshing all at the same time. Remove the cylinder drive belt and rotate the cylinder by hand. Allow it to stop and, if it stops consistently at one point, you have an unbalance problem which will cause excessive wear of the cylinder bearings. This can be corrected by adding washers to the bolts holding the bar on the light side of the cylinder.

It is a good idea to look over the straw walkers and shoe assemblies before harvest. This is an area of the machine which experiences a lot of vibration and is prone to development of loose rivets, bolts, and bearings. Now is the time to tighten things up and straighten out any bend in the sieves that you might detect.

Go around the machine and tighten up the belts and slip clutches that you loosened last fall. If you took the various drive chains off the machine, replace them.

Replace the battery (fully charged, of course), fill up the cooling system, fill the fuel tank, and start the engine. If you did not do an ignition tune up last fall, it is time to check the plugs and points.

Have someone run the controls of the machine while you simply walk around it and make sure that everything is operating correctly.

Field Operation and Adjustment

From a functional standpoint, the operation of a combine can be divided into five fairly distinct operations. It must gather, convey, thresh, separate, and clean the grain. Each of these functions takes place in a specific area of the machine; however, improper performance of any of these functions can have profound effects upon the subsequent functions. The ultimate objective, of course, is to deliver the maximum possible amount of clean grain to the bin; however, the many interrelationships among adjustments and operating procedures make the operation and adjustment of the machine a complex compromise. Added to this, of course, one has the extreme variability of crop and weather conditions which occurs from day to day, year to year, and field to field.

In straight combining, the first machine component to encounter the crop is the reel. In general, the peripheral speed of the reel should be set at approximately 1.25 times the speed of the machine. This is just fast enough to pull the standing crop firmly against the cutter bar and force it to fall into the header after cutting. If the reel speed is too high, the ripe grain may be shattered from the heads; if the reel speed is too low, the grain is likely to tangle and be lost. The height of the reel should be set such that the batts are just below the heads of the grain at their lowest point of travel. The centre of the reel should be a few inches ahead of the line of the cutter bar; the taller the crop, the further ahead.

In a lodged crop, a pickup reel is a necessity. Again, the reel speed should be approximately 1.25 times ground speed, but the tines

of the pickup reel should be below the level of the cutter bar at their lowest point and should barely clear the cutter bar in their rearward travel.

In the case of grain which has been previously swathed, the pickup speed should be only slightly faster than the forward speed. You can tell when you have the proper pickup speed when the swath seems to be simply lifted up for presentation to the header. Too high a speed will cause the swath to be torn apart; too low a speed will cause bunching at the front of the pickup; both conditions will result in excess of shatter loss at the pickup. The pickup height should be just low enough to get under the swath. Always operate the machine in a direction so that the head end of the swath is feeding into the pickup first.

The speed of the table auger should be matched to the speed of the material feeding through it. If the speed is too low, bunching problems will occur; if it is too high, winding and grain shatter will result. The exposure of the auger fingers should be just sufficient to present the mat of material to the feeder conveyor; that is, the heavier the crop, the shorter should be the exposed length of the auger fingers. The speed of the feeder conveyor should be matched to the speed of the moving mat of material.

The heart of the combine, of course, is the cylinder-concave assembly. This is where the threshing takes place and no amount of adjustment at other points of the machine can correct for poor operation of this assembly. The operator's manual for your machine will give you specifications for the cylinder speed and concave clearance settings. Investment in a tachometer or a revolution counter for cylinder speed setting will be paid back very quickly. After setting the cylinder speed and concave spacing to the manufacturer's specifications for

the crop being harvested, fine adjustments may be made after starting harvest. Look at the mat of straw which is discharged from the rear of the machine and check the following points. If you find heads of grain with some kernels still attached, the action of the cylinder concave assembly is not aggressive enough. On the other hand, if all of the grain has been removed from the heads and the straw is broken into small pieces, the action is overly aggressive. If either of these problems exists, adjust the cylinder-concave clearance first; in the case of overthreshing, increase the clearance, in the case of underthreshing, decrease the clearance. If the problem still is not corrected, adjust the cylinder speed slightly. Always make only one adjustment at a time and check for changes in performance before making further adjustments. You will find that, for a heavy crop, the cylinder concave clearance will have to be greater than the manufacturer's specifications; conversely, in a light crop, this spacing will have to be decreased from manufacturer's specifications.

The straw walkers and chaffer sieve make up the separating section of the machine. In actual fact, however, 80 per cent of the separation of grain and chaff from the straw should take place in the concave grate. If more than 20 per cent of the grain moves into the straw walker section, it is unlikely that all of it will be removed by the action of the walkers. Proper speed of the straw walkers, as specified by the manufacturer, is absolutely essential. This can be checked by means of a tachometer on a suitable shaft or some rapid counting in conjunction with the use of the sweep hand on a wrist watch. Overloading of the straw walkers is another very common cause of high grain loss. To check the efficiency of the straw walkers, simply catch a large handful of straw at the discharge end of the machine and check for

loose kernels in this. Any significant number of loose kernels is an indication of unnecessary straw walker loss.

The two adjustments of the chaffer sieve are opening size and air velocity. The opening size will be specified by your operator's manual for the crop in question. The speed of rotation of the fan and air deflector plate adjustment will also be given in the manual. Some field adjustment will most likely be necessary, however. In general, the main portion of the air blast should be directed toward the front of the chaffer, otherwise, grain will be blown out the back of the machine. The front portion of the chaffer should have a smaller opening than the rear portion. If you find many unthreshed heads coming off the back of the chaffer or if more than about one tablespoonful of material per section of the tailings elevator is being delivered back to the cylinder, it is likely that the concave clearance is too great.

The shoe sieve is the cleaning device which is supposed to remove the last bits of chaff from the grain before it is taken to the grain bin. If too much trash and chaff is found in the grain bin, the opening of the shoe sieve should be decreased a small amount. If, however, you detect single kernels going out the back of the cleaning section, the chaffer openings should be opened somewhat. The settings of the fan, chaffer sieve and shoe sieve are a compromise; if the chaffer is open too wide, the shoe sieve is likely to be overloaded with chaff. Similarly, if the concave cylinder clearance is too small, the chaffer is likely to be overloaded with broken straw pieces. Therefore, it is essential to analyse carefully the source of your grain losses before making adjustments in the machine. In any event, never make more than one adjustment at a time; otherwise, you will not know the effect of the various adjustments that you are making.

New Developments in Liquid Manure Injection

by Professor Edward McKyes
Department of Agricultural
Engineering

Any farm with animals has the problem of manure storage and disposal. Allowing liquid runoff from manure piles to enter streams is being monitored strictly these days by government environmental agencies. In addition strong odours from liquid and solid manure storage or surface spreading in fields have been the cause of many complaints by the neighbours of farms, and numerous legal actions against farmers for manure odours have been successful in recent years. For these reasons alone the idea of injecting manure below the ground surface is attractive because one or more inches of uniform soil cover is enough to absorb all odours from the waste material. But there are additional benefits, including the improved conservation of nutrients, especially ammonia, which might be lost quickly when spread on the soil surface. The total value of just the nitrogen, phosphorous, and potassium in manures runs from \$4 to \$12 per ton, depending on the source animal, which does not include the other essential elements which are contained in almost perfect proportions for plant needs.

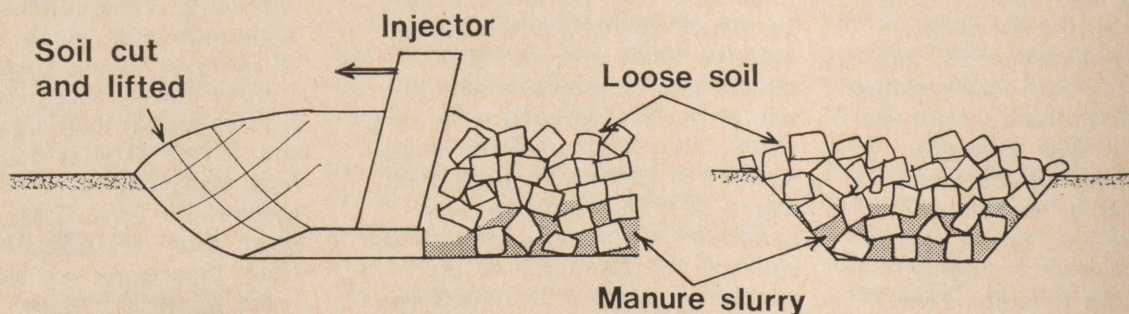
The main obstruction to injecting manure to date has been the lack of availability of reliable and

efficient injection devices. Most commercial liquid injectors are constructed with a 2½ inch wide curved chisel shank with a 3 in. diameter tube attached at the rear. The chisel is supposed to open a sufficient volume of soil to contain the desired application rates of manure, up to 15,000 gallons per acre for manure of low nitrogen concentration. What has not been considered is the amount of soil that has to be disturbed and loosened by a tool in order to create enough new void spaces in the soil. If new spaces are not provided in a stable soil structure, then liquid manure will not stay under the surface but will be forced out on top, which brings back the problem of runoff and odour. Figure 1 shows the principles of successful injection in which soil is cut, lifted and loosened and then flows behind the injector to fall back on the same path and cover the injected liquid. The new voids can contain the injected liquid so it does not tend to be forced up to the soil surface.

At 30 in. between injection rows it takes 18,270 ft. of travel for one injector to cover an acre. This means that a liquid application rate of 15,000 gal/acre requires .92 gal/ft. of travel to be injected, or 21 square inches on the cross-section of the injector path. Since common topsoils loosen in density by about 20 to 50 per cent when properly cut and lifted, it

means that between 2 and 5 times the liquid volume to be injected must be disturbed in terms of soil volume. At the 15,000 gal/acre application rate, from 42 to 105 square inches of soil have to be cut on a cross-section. This volume of soil is generally much easier to cut with a shallow wide tool than with a narrow deep one, especially in wet soils which tend to slide around narrow tools rather than be lifted and broken up.

In 1975 a project was begun at Macdonald College to study the injection problem and to develop a better device for the purpose. The research was supported by the Canadian Department of Supply and Services and involved the author and Professor John Ogilvie, along with Dr. Satish Negi, George Eades, Colin Lovegrove, and Dick Godwin who came on leave from the National College of Agricultural Engineering, at Silsoe, England. By using soil mechanics theory it was possible during the study to calculate the size of tool required to cut the necessary soil volumes and to design the best angles of approach for a minimum draft force and good penetration. The final design is shown in Figure 2 for injection between 30 in. rows of young corn without disturbing the plants. Two prototype models were constructed at the Department of Agricultural Engineering in 1975 and 1976, one of which was attached to a tractor three point



Successful subsurface injection: Soil must be loosened, lifted and redeposited on the injector path to provide new spaces and cover for the liquid manure.

hitch and the other of which was mounted on the front of an 800 gallon liquid manure tank wagon.

Field tests were performed over a year's time with the two models and measurements were made of application rates, soil disturbance, soil cover and draft force requirements. The energy required to pull the injector was found to be quite low, the draft force not exceeding 1,500 lbs. at 6 in. operating depth. In sand, clay, and loam soils it was found that a 1 gal./ft. application of liquid manure was mixed with up to 4 in. depth of soil. This means that at a 6 in. operating depth there were 2 in. of soil cover to the ground level plus the extra weight of loosened soil above the original surface, as shown in figure 1.

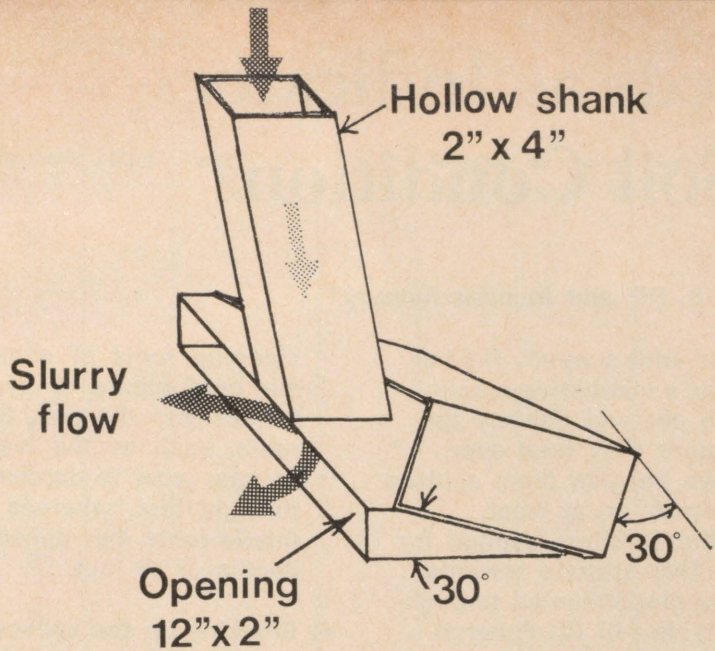
TABLE 1. Quantities of nutrients produced by animals in a 365 day period.

Animal	lbs. Nitrogen	lbs. P ₂ O ₅	lbs. K ₂ O
Dairy cow	140	65	175
Beef cows	140	65	175
Pigs (30-200 lb)	140	79	49
20 chickens (5 lb)	140	112	62
30 friers (0-4 lb)	140	63	54

Source: Jones and Lane, Land requirements for utilization of liquid manure in crop production. Min. Agr. and Food of Ontario, June 1968.

Injection was also done between rows of young corn plants about 18 in. high at manure application rates of 1/2 to 1 gal./ft., or 9,000 to 18,000 gal./acre, and at speeds of 2 1/2 to 5 mph. Good cover was achieved at all times in the sandy soil and it was possible to inject 20,000 gal. in 10 hours' time even with the field a mile from the manure storage tank.

Since this design of liquid manure injector passed every test with good performance, it is hoped that it might be developed by one or more equipment manufacturers to the stage of large production. It could then be available as a convenient tool to all farms where the spreading of liquid manure has been a problem, and it could help to turn the problem into a benefit for plant nutrition in the fields.



The Macdonald injector design to accomplish successful injection of liquid wastes.



The prototype injector mounted with a parallelogram hitch to the farm 800 gal liquid manure tank.



Injecting liquid swine manure at a rate of 1 gal./ft and at a speed of up to 5 mph. Note the proper covering of the liquid even in a loose sand which was wet.

Weeds as Indicators of Soil Conditions

by Stuart B. Hill and Jennifer Ramsay*

Confronted with a weedy field or garden, one's instinctive reaction is to rush out and destroy the weeds before they take over. Perhaps we imagine them choking out our plants, or, at least, stealing the fertilizer applied for our crop. This attitude towards weeds has predominated throughout history. In 110 AD Plutarch wrote "The richest soil if uncultivated produces the rankest weeds" (Lives: Coriolanus); and more recently Oscar Wilde wrote "The vilest deeds like poison weeds Bloom well in poison air" (The Ballad of Reading Gaol).

Only Lowell and Emerson have injected a ray of hope for the weed. Lowell suggested that "A weed is no more than a flower in disguise" (A Fable for Critics); and Emerson asked, "What is a weed? A Plant whose virtues have not yet been discovered" (Fortunes of the Republic). Could weeds really have some virtues, a beneficial side to their character? It seems unlikely. Well, yes, actually weeds do have some points, in their favour. For example:

- 1) Many weeds protect our topsoil from the eroding forces of rain, wind, and sun, especially when the crop cover is poor.
- 2) By providing a cover vegetation, weeds enable beneficial soil animals to be active at the surface, depositing their nutrient-rich faeces and/or acting as biological control agents against various insect pests.
- 3) Many weeds, particularly perennials, possess extensive root systems that penetrate deep into the subsoil, breaking it up and enabling the less

vigorous roots of some of our crop plants to penetrate further into the soil. Some roots, such as the leafy spurge, grow to depths of four to eight feet, whereas Canada thistle roots may penetrate to depths of 20 feet.

- 4) Breaking up the subsoil also improves drainage and aeration.
- 5) Deep penetration by their roots often enables weeds to accumulate various elements from the subsoil, particularly trace elements, and transport them to the soil surface. Through the weed's subsequent death and decomposition, these elements become available to crop plants with less extensive root systems. Different "accumulator" plants concentrate different elements. Interestingly, the accumulated elements are often those in which the particular soil is deficient. Some farmers have utilized this property of certain weeds by employing them as green manure. For example, Rogers *et al.* (1939) found that a local case of Floridian disease in corn, called white bud, was associated with zinc deficiency and could be prevented by allowing zinc accumulator weeds to develop during fallow years.
- 6) Weeds that accumulate different elements have also been used by prospectors. By analyzing different parts of the plants for high concentration of certain minerals, they have been able to determine the location of mineral deposits such as copper and selenium (Brooks, 1972).
- 7) Weeds have also been used as indicators of the presence and quality of ground water (Chikishev, 1965).
- 8) In the past, weeds have often

been used both as food and as pharmaceutical products. Interest in these uses and in their development as resources for various industrial products is currently growing in the "developed world".

- 9) However, the primary value of weeds under consideration in this article is their ability to reveal information about the properties of our soils, particularly their nutritional status, pH, and presence of a hardpan. Frederick Clements (1920), the eminent U.S. botanist explained this property when he stated: "Each plant is an indicator. This is an inevitable conclusion from the fact that each plant is the product of the conditions under which it grows, and is thereby a measure of these conditions. As a consequence, any response made by a plant furnishes a clue to the factors at work upon it".

Since many weeds are "specialists" they are likely to be particularly useful as indicators. Different weeds are adapted to different ranges of environmental variables and are able to grow only where their particular needs are met. For example, certain species, such as knawel, are confined to acid soils, while others are limited to basic soils.

The use of weeds as soil indicators is not a new concept. In 50 AD, the great Roman scholar, Pliny the Elder observed that land supporting wild plum, elder, oak, and thimbleberry was also favourable for wheat production. Many North American immigrants chose land for their farms according to the vegetation it supported. They quickly recognized that white pine — Norway pine — jack pine communities were characteristic of sandy soils of little agricultural value, whereas forests of birch, beech, maple,

*Dr. Stuart B. Hill is an assistant professor in the Department of Entomology and Jennifer Ramsay is a research assistant at Macdonald College.

Table 1

SOIL PROPERTIES

QUEBEC WEEDS (● noxious weeds)	Structure	Texture	Moisture	Tillage	Reaction (pH)	Fertility	Nitrogen	Potassium	Phosphorus	Salinity
agrimony.....	H	S	D	T	L	f	n	k	p	
aster, swamp.....			W							
bellflower, creeping.....										
● bindweed, field.....										
bindweed, hedge.....			W							
bracken, Eastern.....										
buttercups.....										
buttercup, creeping.....			W							
● campion, bladder.....										
carpetweed.....										
carrot, wild.....	H	S		T	L	f	n	k		
● catchfly, nightflowering.....			D							
celandine.....										
chamomile, corn.....			W							
● chickweed.....										
● chicory.....										
● cinquefoil, silvery.....			D							
clovers.....										
clover, hop.....										
clover, rabbit-foot.....			D							
clover, red.....	H	S		U	A	f	n	K		
clover, white sweet.....			D							
cockle, white.....										
colt's-foot.....			W							
cornflower.....										
cornflower (flower: blue).....										
cornflower (flower: pink).....										
cotton grasses.....			W							
cudweed, low.....			W							
daisy, English.....										
● daisy, ox-eye.....	H	C	W	U	A*	f	n	K		
dandelion.....										
● docks.....			W							
● dock, broad-leaved.....										
foxtail, shord-awned.....			W							
fumitory.....										
● goldenrods.....			W							
goosefoot, oak-leaved.....										
grass, quack.....										
groundsel, common.....										
● hawkweeds.....	H	S		T	A	F	n	K		
hedge-nettle, marsh.....			W							
hellebore, false.....			W							
hemlock, poison.....			W							
henbane, black.....										
henbit.....										
horebound, common.....										
horsetails.....										
horsetail, field.....										
horsetail, marsh.....			W							

KEY

1. Names used are those listed in Ferron, and Cayonette (1975).

Structure

H — Hardpan and/or crusty surface

Texture

S — sand/light

C — clay/heavy

Moisture

D — Dry, often with thin topsoil

W — wet, waterlogged or poorly drained

Reaction (pH)

A — acid or low lime

A* — especially on lawns

L — high lime

Fertility (general)

f — low fertility and/or humus (especially if weeds pale and stunted)

F — high fertility and/or humus (however, if weeds are pale and stunted then fertility is low)

Tillage

T — tilled/cultivated

U — uncultivated/neglected

Nitrogen

n — low nitrogen

N — high nitrogen

Potassium

k — low potassium

K — high potassium

Phosphorus

p — low phosphorus

P — high phosphorus

Salinity

s — saline tolerant species

SOIL PROPERTIES

QUEBEC WEEDS (●noxious weeds)	Structure	Texture	Moisture	Tillage	Reaction (pH)	Fertility	Nitrogen	Potassium	Phosphorus	Salinity
joe-pye weed.....			W							
knapweeds.....					A			K		
knawel.....					A					
●knotweed, prostrate.....				T	A					
lady's thumb.....			W		A		F			
●lamb's quarters.....				T						
●lettuce, prickly.....				T						
mallow, musk.....				T						
mare's-tail.....			W							
mayweed, stinking.....		C	W		A					
meadowsweet, broad-leaved.....			W				n			
medic, black.....			W							
mosses.....				U		f				
mugwort.....				U	A	f				
mullein, common.....										
●mustards.....	H									
●mustard, hare's-ear.....					L					
●mustard, white.....					L					
●mustard, wild.....			D		L					
●mustard, wormseed.....										
nettles.....				T	A					
pansy, wild.....					A*					
parsnip, wild.....				U	L	f				
pepper grass, field.....										
pigweed, prostrate.....			D							
●pigweed, redroot.....				T						
pineappleweed.....	H		W	T	A*					
plantains.....		C		U	A	f				
radish, wild.....										
ragwort, tansy.....			W							
rape.....							n			
rape, bird.....	H									
robin, ragged.....			W							
rushes.....			W							
sedges.....			W							
shepherd's purse.....										S
silverweed.....			W							
smartweeds.....			W							
sorrel, garden.....			W		A					
●sorrel, sheep.....		S			A					
●sow-thistle, annual.....		C			L					
sow-thistle, perennial.....			W							
speedwell, common.....			D							
speedwell, field.....				T						
speedwell, thyme-leaved.....			W							
spurge, leafy.....			D							
spurges, (some).....				T						
●spurry, corn.....		S			A					
●stinkweed.....	H				L					
strawberries, wild.....					A					
sundews.....					A					
thistle, Canada.....		C								
thistle, nodding.....					L					
thistle, Russian.....			D							S
toadflax.....		S								
vetches.....							n			
water-hemlock, spotted.....			W							
wormwood, biennial.....				U		f		K		
yarrow.....								k		

hemlock indicated more fertile soils.

It has been shown that the tall-grass prairies are suitable for orchards, cereals, hay, and fodder crops, while bunch grass regions are more suitable for wheat and grass production (Shantz 1911, Sampson 1939). Wire grass areas are less productive and short grass communities least productive. Highly alkaline soils are unsuitable for arable use and are characterized by tussock grass, salt grass, and greasewood (Hilgard 1906).

The information on weed indicator species is poorly documented, much of it residing only in the minds of observant farmers and gardeners. In preparing the list of weeds in Table 1, numerous sources, some reliable and some undoubtedly less reliable, were consulted. Consequently, the information contained in it should be used as a basis for further observation and research rather than as a guarantee of what to expect from a soil. Before using such a table, there are several things to consider:

1) Some weeds have "ecotypes"

Populations of a particular weed growing in different locations may differ slightly from each other in their appearance and requirements; they are referred to as "ecotypes". Thus, the ecotype of a particular weed in one area may be more tolerant of acid soil conditions than the ecotype of the same species in another area.

2) Limits of tolerance to environmental factors vary

Plants, including weeds, differ enormously in their degree of tolerance to changes in soil pH, moisture content, etc.; and some have a narrow tolerance for one variable but a wide tolerance for others. The best indicators are those with narrow tolerances because they would only be found associated with specific conditions.

3) Plants may be sensitive to

several environmental factors

When we look at Table 1 we notice that many of the plants are listed in more than one category of environmental factors. For instance, perennial sow thistle and docks are both indicators of wet areas; however, the thistle has a preference for more acid soils whereas docks are found in soils with a high lime content. Thus, when interpreting the presence of a weed we need to know all the factors to which it is responding.

(4) Perennial weeds often make better indicators than annuals

Perennial weeds, having been able to tolerate the conditions in a particular locality for more than one year, are often more reliable indicators than annuals, which may survive only one season.

(5) Weed communities are better indicators than single species

The presence of a group of weeds that are associated with one another because of similar requirements for certain soil conditions provides a more reliable indicator in contrast to a single weed species, which may only indicate chance establishment.

(6) Growth characteristics of a weed may be as revealing as its presence

The growth characteristics of weeds and the colour of their leaves and flowers may be as important as their presence in revealing information about the soil. A vigorous growth of leguminous weeds usually indicates a soil lacking in nitrogen; as does the presence of stunted non-leguminous weeds with pale green leaves. Cornflowers make particularly useful indicators as their flowers are blue when found on soils with a high lime content but are pink when they are growing on acid soils.

The observant farmer and gardener will notice subtle changes in the

weed populations on his land in response to his agricultural practices. As his soil improves he may find that chickweed, chickory, common groundsel, common horehound, and lambs-quarter become the dominant weeds. However, if he finds that the daisy, wild carrot, mugwort, common mullein, wild parsnip, wild radish, and biennial wormwood become dominant, he should review his practices as these weeds thrive on soils of low fertility. The addition of well-balanced compost, organic manures, and other fertilizers together with certain tillage and drainage practices may be required to bring the soil back into production.

We are not advocating that all weeds be encouraged indiscriminately, for even "beneficial" weeds poorly managed, will reduce yield. What we are suggesting is that by being able to identify the weeds on our land and know what their presence indicates, we will be in a better position to manage our soils wisely.

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The Family Farm



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FORAGE SYSTEMS FOR THE FEEDING OF DAIRY CATTLE*

Grazing

Grazing systems differ greatly, ranging from natural grazing on hardly arable or totally unarable fields, to short-term and long-term pasturages. Depending on the soil's fertility and its management, the various systems require the following acreage per cow: two to four acres for continuous grazing, one to two acres for rotational grazing and three-quarters to one acre for strip grazing.

The amount of grass consumed daily varies. Above all, it is determined by its abundance and palatability. A large or medium cow consumes from 125 to 150 pounds of grass per day. Such intake should adequately meet the animal's nutrition needs and ensure a daily milk yield of 30 to 35 pounds. These are optimum averages possible only under ideal conditions.

Since several cows on pasture can produce more than 35 pounds per day, they must be given feed supplements to help maintain their weight and ensure good herd yield. The dairy producer must handle with care and sound judgment the complementary feeding of his cows on pasture if he wishes to avoid waste and to prevent a drop in milk production and a loss of weight in his cows. He must consider the condition of the pasture, the time of the year, and the level of milk production.

Since grass is rich in protein, the meal for animals on pasture need not have a high protein content. The older the grass, the more protein should be added to the meal. In determining the composition of the meal, the condition of the pasture, the cow's individual yield, the cost of meal and the current price of milk should be considered. In order to maintain high milk yields, dry forage should be fed to dairy cattle throughout summer and, if necessary, meal should be given as a supplement. Cows need large quantities of fresh water.

- a) **Continuous grazing** is not recommended. Even if it requires less work, it reduces milk production per acre by 50 per cent compared to rotational grazing, and results in the use of only 50-60 per cent of the plants.
- b) **Rotational grazing** is the most recommended because, if well managed, it results in a good milk yield per acre, using up to 75 per cent of the plants. If possible, rotational grazing should be carried out near a barn and should not be too intensive. It should consist of a minimum of four fields, each grazed in turn. Mowing is necessary to eliminate left-over grass.
- c) **Strip grazing** consists in providing every day a new area for grazing. It is difficult to apply, requiring a great deal of work

to obtain higher milk yields and is not very practical for a herd of more than 50 to 60 cows. It requires planning in advance for the entire grazing season. This means that in springtime we can expect a surplus of grass to be harvested either as hay or as silage.

- d) **Substitute grazing** The farmer must sometimes resort to substitute crops to supplement insufficient grazing. Green oats, Sudan sorghum, sorghum hybrids, fall rye, common Kale (Q.P.P.C. 337-annual plant guide) and other crops or their combinations may be used for this purpose. Provisional or substitute pasturage yields less than regular grazing. The crops do not stand up well to trampling and their seeding always entails additional costs. Nonetheless, they are important complements to ordinary grazing and are often apt to prolong the grazing season.

Zero Grazing

With the advent of larger herds and certain grazing problems, several dairy producers use the farm machinery available to haul feed to their cows. Such a system requires a field chopper and a wagon. The latter may be used as a feeder or be equipped with an automatic unloading system which supplies the feeder set on a cement surface. A paved area of 50 square feet should be provided per animal. Zero-grazing allows for a constant supply of grass and a more uniform milk production. In addition, since cows do not have to move from one area to another, more of their feed goes into producing milk.

*Quebec Livestock Productions Council.

With this system of grazing, it is easier to check the herd and thereby detect estrus, diseases, and wounds. Zero-grazing eliminates the loss of grass from tramping, dejecta, and plants not normally used for grazing. It uses 85-95 per cent of all plant as compared with 50 to 65 per cent for other systems of grazing. It requires 0.5 to one acre per cow instead of the one to four acres needed for other types of grazing. It also does away with fences, except for those enclosing cow pens.

Although this system is an improvement over other grazing systems, it is not perfect. Having to spend from one to three hours daily on securing fodder requirements, several dairy farmers who had formerly adopted this system are more and more feeding silage to their cows throughout the year.

Dry Forages

a) Baled hay
Since 1940, the hay baler has been the conventional equipment used for harvesting hay. Hay baling is an operation requiring about one hour per ton if the bales are moved directly onto a wagon, and two hours per ton, if they are picked up after having been field cured.

Because it needs a great deal of handling, the hay baler has become an expensive item on many a farm. However, since it requires little investment it will continue to occupy a place of honour on many average farms.

b) Chopped Hay
Although the cost of chopped hay is comparable to that of baled hay, its system is a lot less flexible because it is not easily adaptable to certain types of barns. Moreover,

numerous failures caused by overly moist hay hardly encourage dairy producers to use this method.

c) Drying Hay
In producing baled hay and chopped hay, it is recommended and even necessary in certain regions to complete drying the hay in a barn with the aid of a dryer emitting air at room temperature. When part of the drying is done in the barn, a shorter time is needed for field drying, thereby reducing the risk of losses from unfavourable weather conditions. In addition, it allows for haymaking at a time when hay is sufficiently moist to prevent an excessive loss of leaves. It also facilitates the cutting of the plants at an ideal stage of maturity. However, the handling of bales is more strenuous and requires more manpower to stack the bales in the barn.

Silages

A feeding program entirely based on silages helps to make the most of land seeded to forages. Forage crops may be harvested at a stage of maturity when their feeding value equals that obtained by grazing or green feeding. Since they are harvested very quickly, the quality of the forage is uniform, thereby contributing to a steady milk yield. Keeping the cows in a pen during the summer requires more elaborate installations, increased equipment, and greater storage capacity. For a comparable milk yield, cows under this system probably need more feed than if on pasture. A silage feeding program for the entire year is suitable for dairy operations consisting of more than 60 cows and which are already equipped for automatic feeding.

a) Moist silage (moisture of 70 per cent or more)
Losses are very low at hay-making but high during storage. Losses through leakage are directly proportional to the moisture content of the silage. If the losses caused by fermentation are also considered, total silage loss may range from 10 to 30 per cent. The unpleasant odour that it gives off and winter frosts have caused a drop in the use of this type of silage. In addition to silage, cows must be given a certain quantity of hay so that they may consume the maximum of nutrients from the forages. Moist silage stores well in horizontal silos if preservatives are used.

b) Wilted silage (60-70 per cent moisture)
If grasses are lightly field dried, the need to use preservatives is eliminated. This results in a better fermentation and prevents leakage. It is the type of silage most recommended in Quebec.

c) Haylage (45-60 per cent moisture)
Haylage is obtained by prolonging the field drying of grass. This silage requires airtight silos because, if air penetrates, considerable losses will result from moulding. Moreover, the hay will heat and its digestibility will be greatly reduced. Very fine chopping and a very high silo will help to obtain good results. This type of silage requires less labour and handling than dry hay. It helps to reduce the time needed for field drying and consequently the risks of losses from unfavourable weather. Moreover, in case of poor weather, grass may be ensiled at a higher moisture level.

Losses from leakage and fermentation range from 5 to 10 per cent compared with 10 to 30 per cent from moist silage. Since it has a better odour, it is more readily accepted by the animals and consequently consumed in greater quantities. Cows take in as much dry matter from haylage as from hay. Because actual freezing does not take place when the silage has a 50 per cent moisture content, the problem of freezing is practically eliminated. However, this is not the case for the airtight silos of vitrified steel with bottom discharge. The moisture content of hay ensiled in this type of silo must not be greater than 50 per cent because even partial freezing will prevent the downward movement of the hay in the silo.

This system requires that silos be airtight and that the silage be chopped very short so that it may be piled more easily. Wagons must be covered to minimize field losses, and silos filled as soon as possible to reduce heating. In addition, there should be an automatic distributor inside the silo and the silage should be covered to prevent wastage.

d) Ensiling corn

Ensiling corn results in greater yields of dry matter and energy per acre. Corn lends itself well to ensiling, and livestock accept it willingly. Field-to-animal operations may be completely mechanized and harvesting may be carried out in one operation. Silage corn requires that the ration be balanced with proteins, vitamin A, and certain minerals such as calcium. Demanding cultural conditions in terms of heat unit requirements, drainage, and fertilization are reasons why corn cannot be grown in all of Quebec's agricultural regions.

For maximum yield, corn should be harvested at the milk stage. At such time, its dry matter content of 30 per cent is high enough to prevent silo leakage. While riper corn represents greater field losses, corn harvested at the milk stage means higher losses during storage. It should be remembered that, contrary to hay, the nutritive value of corn increases with maturity. As with all silage, it should be chopped very short, about one quarter inch in length, to contribute to airtightness in the silo.

Combined Systems

Regardless of the system used, quality is most important in order to increase the intake of dry matter and reduce the need for meal.

a) Hay and grazing

This system is very popular and needs little outlay. However it requires considerable labour, something few dairy farmers can afford.

b) Hay, silage, grazing, and zero-grazing

This system, which requires twice as much mechanization, can be economical only if used for herds numbering 80 animal units or more.

c) Year-round corn silage with little hay

Because the exclusive use of corn silage as source of fodder entails certain risks in feeding, supplementing it with either 5 pounds of hay or 10 pounds of haylage is recommended. A monthly sample of the corn silage should be taken in order to maintain a balanced ration for the dairy cows.

Year-round feeding of corn silage results in a better use of silos and their equipment and makes complete mechanization possible. Standardizing the quality of forage and increasing the per-acre yield will result in higher milk production per acre. It also ensures maximum labour efficiency. However, this system cannot be adopted everywhere, nor by all dairy producers. A sizeable and productive herd is required if the considerable outlay is to be worthwhile.

Efficiency and evaluation of the various feeding systems

If the above feeding systems are properly used, a cow's daily milk production will not vary from one system to the other. Per-acre milk yields, however, may vary greatly depending on the harvesting system used. As a matter of fact, Table I indicates an increase in per-acre milk production with

TABLE 1 Efficiency of the various systems of harvesting forages for dairy cattle

Harvest Systems	Dry Matter Available lb/acre	Dry Matter Consumed lb/acre	% Loss	Milk Production		Concentrate lb/day/cow
				lb/day/cow	lb/acre	
Rotational grazing.....	5,800	3,300	43	43.3	3,400	4.5
Strip grazing.....	6,100	4,200	31	37.1	4,300	5.2
Zero-grazing.....	5,500	5,300	4	37.9	5,200	4.9
Stored feeds.....	7,100	6,300	11	36.3	6,100	8.3

the stored feeds system, followed by zero-grazing, strip grazing and rotational grazing. Cows on silages consumed more concentrates than those on other systems. The dairy producer who must choose a feeding program must first of all study the state of his farm. If, for example, the cost of land is high, he will probably opt for a silage system in order to obtain a maximum number of pounds of milk per acre.

The need to obtain optimum yields from his fields may force tomorrow's dairy producer to adopt a system in which the per-acre milk production will be the main criterion.

Complete rations

The traditional system of feeding dairy cattle is to give forage on a free-choice basis and to add individual meal supplements according to the animal's age, weight, milk yield, fat content, and gestation period. This system's main drawback is the difficulty in predicting a cow's individual consumption. Consequently the accuracy with which grains are distributed is severely affected even though grains may be given separately to each animal.

The development of new systems of housing for dairy cattle, i.e., loose housing with free stalls has

created new problems. Increased milking efficiency has reduced the amount of time cows spend in milking parlours. Consequently, the short time cows spend in these milking parlours may not allow high producers to consume sufficient feed to fill their nutritive requirements.

In addition, there seems to be individual differences in the preference for forages over meal, especially at the start of lactation when these two types of feed are given on a free-choice basis. Such is also the case for minerals which are given in this manner. Recent experiments have shown that cows on different diets may have a much higher intake of minerals than they actually need. Some of these difficulties may be avoided by using complete rations which are mixtures of all the necessary nutrients. Cows on complete rations generally yield as much as those fed nutrients separately. It has been shown that complete rations of 60 per cent concentrates or more result in a lower fat content of milk and in a greater frequency of physiological and metabolic disorders among dairy cattle. A herd's optimum percentage is about 40 per cent. Complete rations, containing less than 30 per cent concentrates will not

yield more than 40 pounds of milk per day. Dried cows should be separated from cows in lactation and given a ration which meets their nutrition needs.

In summary, some advantages of complete rations:

They allow the complete automation of feeding and need less manpower. They do not necessitate any equipment for the distribution of concentrates in the milking parlours. They allow for greater flexibility with respect to the use of protein supplements and eliminate the need for unrationed mineral supplements. They contribute to a more efficient use of urea since cows on a complete ration eat frequently, and in so doing, they decrease the surplus production of ammonia in the rumen. They greatly simplify the process of formulating rations for dairy herds.

Nevertheless, **complete rations present certain disadvantages** such as the need for special equipment to mix the ration well, difficulty in feeding hay efficiently and the addition of pens to form groups of cows.

IMPORTANT AMENDMENTS TO REGULATIONS GOVERNING THE AGRICULTURAL MERIT COMPETITION

The Quebec Department of Agriculture wishes to inform farmers of the amendments to the regulations governing the Agricultural Merit competition, more specifically as regards admission requirements and classes of competitors. With the last amendments dating back to 1961, new ones were necessitated by recent developments in agriculture. The competition is open to all candidates who meet the required conditions and are involved either alone or in partnership in crop and livestock operations. Father-son operations, livestock and poultry operations, in addition to agricultural operations, corporations, co-operatives, and partnerships as defined under the Farm Credit Act are now eligible to compete.

Moreover, the new classification system for competitors, while

retaining the gold medal class, provides for two distinct categories for the silver medal and the bronze medal, each with its own ribbons, diplomas, and prizes. The bronze medal therefore takes on more importance and is recognized as the first step for new competitors before they may advance to compete for higher honours.

The candidates in each of the three categories are divided into two classes: the professionals, who make their living mostly from farm work and whose principal source of income is their land or livestock; and the non-professionals, who are not farmers by profession.

Changes to the system of classification have also brought about a revised distribution of prizes. For example, these changes enable the three top competitors for the

bronze medal who have obtained 875 points or more to win \$250, \$150 and \$100 respectively in prize money. The three top contenders for the silver medal win respectively prizes of \$600, \$500 and \$400. The first place winner in the gold medal category is awarded \$1,000, the second place winner \$600, and the third place winner, \$400 provided all three obtain 900 out of a possible 1,000 points.

The Agricultural Merit competition has been held annually since its inception in 1890. It owes its continuity to periodic amendments to its regulations in order to adapt them to changing conditions in agriculture.

(Continued from page 11)

AGRICULTURAL MERIT COMPETITION TO BE HELD IN REGION NO. 3

This year the Agricultural Merit competition will be held in Region No. 3 which includes the municipal counties of the Beauce, Bellechasse, Dorchester, Frontenac, Kamouraska, Lévis, L'Islet, Mégantic, Montmagny, Rivière du Loup and Témiscouata. As is already known, the province is divided into five sections for this competition which each year takes place in a different region so that the entire province is covered every five years.

In 1972, the last competition held in Region No. 3 attracted 105 participants. That year, the gold

medal was awarded to Mr. Henri Mareau of St. Agapit (Lotbinière) and the silver medal to Mr. Jean-Paul Auger of Ste. Emmélie (Lotbinière).

Recent changes which aim to make the regulations governing the competition more realistic, simplify registration procedure. They are especially designed to attract new competitors who will now be regrouped in the bronze medal category, the first level of the competition.

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QWI

y Impressions of WI

inking of something unique to
rite about Women's Institute,
decided to write of my own
pressions gathered about Home
d Country women over the
ears, what WI has meant to me
d, I presume, to other members.

y first recollections go back
veral years to when I was a
ungster at the little village of
omifobia. At that time there
as a Tomifobia branch of WI,
d, ironically, it was some 50
ars later when I was County
resident that this branch
sbanded.

at back in time, Tomifobia branch
as to entertain the Stanstead
ounty branches for the annual
eeting, in May, I do believe.
he meeting was held at our
ome and the late Mrs. Gordon
earl) Temple was branch
resident. I well remember how
is gracious lady greeted the
any people that came to attend
om rural areas of the County.
was young, but I "snooped"
ound to listen to what it was
I about and I met several of
e ladies.

erhaps next in my recollections
me the formation of Stanstead
orth WI branch about 1927 or
1928, depression days. We heard
uch talk about this branch and
ow, when the Mansur school
as closed due to amalgamation
th other schools to Stanstead
ollege, the Stanstead North
branch voted to see if they could
in ownership of the school.
ey gained custodianship from
om the County School Com-
mission. The school has come to

mean a great deal to the area.
It is an historic site, its interior
differs but little from when it
was built in 1819 and used as a
school until 1929. There are many
WI acquisitions on the walls of
the school so it is much like a
museum, and many visitors find
the once one-room school to be
most fascinating.

I grew up, married and became
a housewife and mother. One day
a friend phoned and invited me
to attend a WI meeting that was
to be held at her Rock Island
home. I did attend and was
invited to become a member.
I joined and have found it most
rewarding.

The aims of WI are many and
of high quality. The WI was
started for rural women to gather
and discuss many things: crafts,
making jams, jellies, and pickles,
to help people. The motto "For
Home and Country" is a challenge
in itself. As the years passed
more urban people came into the
membership and joined with the
rural women in their many under-
takings.

All too soon I found myself
serving in the various branch
offices. Later I became County
President and perhaps I did not
do my work too well for three
branches folded — Ways Mills,
North Hatley, and, as I mentioned
before, Tomifobia. I was dis-
tressed but there was little more
I could do as the membership
was just too small; there were
too few to carry on the work.
But once a WI member always
a member, for many from these
branches swelled the numbers
of the five remaining, Ayer's Cliff,

Hatley, Hatley Centre, Beebe,
and Stanstead North.

Women's Institute is a great
organization and its voice is
adhered to. I recall one incident
before I was a member. The
County of Stanstead women
desired something very much
from the School Commission.
Evidently it had been denied the
women but undaunted, ready to
do battle, in full numbers, they
marched to a school commission
meeting. The chairman, now a
retired Rock Island gentleman,
saw them and commented, "Boy,
it's those Women's Institute mem-
bers coming to place their de-
mands and they stretch back as
far as I can see." Later, after the
women got what they went for, I
recall this same gentleman
saying "never underestimate the
power of the Women's Institute,
they know what they want, and
they will get what they want or
else."

In this year of turbulent times in
Quebec, across Canada, and
many world countries, this
determination is required more
and more. Let people say in 1977
"never underestimate the power
of the WI."

There is a place for every woman
in Women's Institute, a world-
wide organization of women in
harmony to make our world a
more comfortable place to make
a home.

Ivy Hatch
Publicity Convener
Stanstead County.

Through the Years

Richmond County's **Spooner Pond** branch celebrated its 40th anniversary at their April meeting. The President, Mrs. H. Blanchard, welcomed the members and guests. The Roll Call, which was bring a small article that you treasure and tell something about it, was answered by 22 members, most of whom had brought lockets, pins, pictures, small dishes, etc. The president presented the Past President, Mrs. W. Lancaster, and the Past Treasurer, Mrs. D. Biggs, with gifts of appreciation of their fine work during their terms of office. Corsages were presented to two of the three Charter members, Mrs. R. Lampron, and Mrs. B. Rodgers, and it was regretted that the third member, Mrs. F. Noble, could not be present. A corsage was also presented to Mrs. W. Parkes, who is County President as well as branch Treasurer. A brief outline of the history of this branch was read. Here are a few highlights: The first meeting of this branch was held in 1937 with Miss A. Dresser on hand to start the branch on its way. Ten members joined, with Mrs. R. Lampron as first President. Membership fees were 25 cents and there were nine convenerships at that time. Present day "tea fees" were then known as the "flower fund" and each member gave two cents per meeting towards this. In 1942, this was raised to 10 cents. Money was raised in various ways: dances, card parties, bingo and crokinole parties, drawings on quilts, tufted bedspreads, aprons, pillow cases, a doll and her wardrobe, an afghan, etc. Food sales were held, weddings and banquets catered for, chicken pie suppers held, booths at the County Fair, sale of Christmas and greeting cards; sale of ribbons, lace and so on. During war years, clothing was sent to evacuated children in Britain; cigarettes and maple sugar sent to the armed forces; jam was made and chickens canned to be sent overseas; donations were made towards the Mobile Canteen Fund; in 1940,

an appeal was received from the QWI office, asking that each member give five cents towards the purchase of an ambulance for overseas. In the same year, the collection of Pennies for Friendship was started. Later years have seen donations change from wartime to peacetime uses. As well gifts are given for the 25th and 50th wedding anniversaries of members; gifts are also given to members' sons and daughters for their weddings; silver dollars are given to the first child born to each of a member's children.

Contests among members have been held on cooking, homemade cards and flower and vegetable collections — the latter is held at the same time as the children's fair in September; members also help at the County Fair. In the first treasurer's book, it is interesting to note the prices of food and other necessities: bread, 10 cents per loaf; sugar, 6 cents per pound; salmon, 35 cents per tin; 2 heads of lettuce, 15 cents; coffee, 45 cents; candy, 10 cents per pound; thread, 9 cents large spool; flannelette, 10 cents per yard.

When dances were held, usually in the members' homes, admission was 25 cents for a man and 10 cents for a lady. At card parties, players each paid 25 cents while non-players paid 15 cents. During war years, prizes at card parties were often War Saving stamps. Quilts made by members were sold for \$5 to \$8. If someone wanted a quilt to be quilted by a group, a charge of \$1.50 was made. Bedspreads were tufted, and if the materials used did not cost more than \$2, the spread was sold for \$4.

Each year, in August, a picnic for families is held instead of the regular meeting and other branches are invited to meetings occasionally. Social evenings have been enjoyed, and meetings have been held on occasion in the Recreation Room of the Wales Home when members who reside there are able to

attend. Several members have entered the J. & P. Coats and the QWI competitions and Inter-branch competitions, the latter is for an article chosen by each branch in the county in turn. A "Travelling Cup" is presented each year, and this branch has proudly held it on six occasions.

This has been a brief glance at the past 40 years, and we look forward to many more years of work "for Home and Country."

Mrs. Dorothy Oakley
Publicity Convener
Spooner Pond WI.

Pineapple Sponge Pie

2 eggs, separated
¾ cup white sugar
1½ cups canned crushed pineapple
1 tablespoon melted butter
Grated rind of a lemon
Pie plate lined with unbaked pastry

Beat egg yolks and add sugar, pineapple, butter, and lemon rind. Fold in stiffly beaten egg whites. Pour into pastry lined pie plate and bake in a hot oven 425° until sponge is set; then reduce temperature to 350° until baked.

Dear WI Members,

Family ties encouraged me lately to make a visit to the province of Alberta, where I spent some time in the High River area. On the trip out, it flashed through my mind that someone from the Cayley district had served as a federated board member of the Women's Institute. I had read also that our organization played an important role in the rural life of the High River, Cayley, and Blackie districts to name a few. So I was most fortunate to meet Mrs. Marion Alexander who has served for two terms as Provincial President of Alberta Women's Institute. She finished her presidency the year the Conference was held in Banff and said she had enjoyed the work

mmensely, and had had so many opportunities due to WI contacts. Marion was the first Canadian woman to be awarded the Grace E. Frysinger Fellowship which sponsors international exchange visits amongst the rural women of the world. Having served as a director of the FWIC along with the presidency of the province, she has been able to present the Canadian viewpoint to her host groups. This award was presented to Marion by Premier Lougheed. She was exchangee for the Women's National Farm and Garden Association, for Mrs. Kay Rockwell. We remember the latter speaking at our annual spring convention a short time ago. Marion travelled for six weeks in the United States, visiting 11 states, and in her words said she was treated "like royalty". I asked her how she was chosen and she replied that each society in Canada, who is a member of the ACWW, has the chance to nominate someone to go before a selection committee, and she proved to be the lucky one.

When she was in Australia and New Zealand she spoke on ACWW and provincial WI work, and plans to go to Kenya to the next ACWW meeting. After lunch at her pleasant ranch home, we went from Cayley to a WI gathering in High River where the ladies were working on a Dresden plate quilt. The quilting pattern was intricate, with excellent handwork. The hostess had a large, large hoop that she had likely used when she was working by herself on the quilt. Marion asked to be remembered to our Quebec members whom she has met at various conferences. Specially she wished me to convey to Edna Smith her wishes for better health. Marion Alexander is a vivacious, resourceful lady and no doubt deserves any honours that have come her way.

Again we have some interesting reports. Eight branches in **Argenteuil** county were heard from. The publicity convener writes, "Our county convention will be held at **Brownsburg** on April 28 in the United Church. Luncheon and

afternoon meeting will be held in the Legion Hall. We hope to have Hon. Francis Fox, Solicitor General and member of parliament for Argenteuil-Deux Montagnes, as guest speaker. Coffee will be served to those coming from a distance before the 10 a.m. session in the church hall. **Dalesville-Louisa** WI are the hostesses." **Pioneer** branch reports that there has been increasing emphasis on conveners reading pertinent news clippings. One such on rural pollution mentioned farmer's lung and silo filler's disease. Also Nova Scotia apples had been bought in bulk by schools, also that skipping rope is a healthful exercise. A very tasty supper was served prior to the citizenship meeting of the **Dalesville-Louisa** meeting. One of their members, who had come from Holland in 1966, recently became a citizen of this country. She explained how an immigrant becomes a Canadian citizen. Possibly at a later date this lady will explain those steps to the rest of us. This member enjoys our country and is proving a good citizen. **Frontier** reports a new member. The speaker for the evening was Mr. Robert Kipp from Bell Canada who presented a very interesting program explaining the telephone, how it works and providing a question period. The members felt they had a much better idea of how Bell Canada operates. The 10 members present at the **Arundel** meeting discussed how best to set up an adult library in the Arundel School. At **Jerusalem-Bethany** they discussed the recently published white paper and members were advised to be more alert about what goes on in politics. A letter was read from the Solicitor General referring to the tragic death of one of their members. Twenty-five members and one guest answered the roll call at **Upper Lachute East End** by naming an outstanding political person; donations were given to the Agriculture Society for junior exhibits, and to the Lachute Fair Fund for prizes and to the Children's Memorial Hospital. **Grenville** also donated to the fair fund and discussed what to put in the handi bags and

Brownsburg ladies were to arrange for a bus to go to the Provincial WI Convention at Macdonald College, and voted \$10 to the Village for Homeless Children in Costa Rica.

Grand Cascapedia reports that the branch celebrated their 25th anniversary at which a special anniversary album was on display containing photographs of former and present members. At the March meeting in **New Richmond West** 11 members paid fees; there were three new members. An article was read on the work done by local Indian artisans. At the meeting at **Black Cape** a finished quilt and two matching cushions were handed in, and the ladies hoped to sell them as a set. Plans were made to have a miscellaneous shower after the May meeting for a lady whose house and all its contents were destroyed by fire. The Salvation Army from Campbellton, New Brunswick, had asked for help from this branch for their spring drive. Then from **Marcil**, the roll call was "Food Additives. Can you name an additive in daily food and what does it do to you?"

From Sherbrooke County, four branches reported. Six members at **Ascot** had perfect attendance for the year. Mrs. William Pearson was presented with a 50-year pin. Articles for CanSave were put on display by the Citizenship Convener. Three members from Belvidere, Myrtle Pitman, Margaret Smart, and Viola Tarte were presented with WI spoons for perfect attendance and Margaret Smart received a gift on retirement as secretary after six years. **Brompton Road** branch purchased a bulb for each member to plant, to be brought to the August meeting to be judged and prizes awarded. At the **Lennoxville** meeting the members gave suggestions on ways to improve the organization. Then in somewhat the same vein, at **Canterbury's** March meeting, each member present gave constructive criticism of their activities of the past year. Some branches that subscribed

to CAC magazine are **East Angus, Brookbury, Gore, Pioneer** and **Richmond Hill. Brookbury, Canterbury** and **Bury** gave money towards a gift for the Secretary Treasurer of the town, W. R. Batley, on his retirement.

The Education Convener, Mrs. C. Dougall of **Fordyce** branch introduced the guest speaker, Mr. D'Arcy Enright, Special Education Consultant for the District of Bedford School Board and Chairman of the Resource Centre, who gave an interesting report of the work done by the Centre and the reasons that some children have learning difficulties. He stressed the fact that these children are not retarded, but have average or above average intelligence. The Centre is now in the process of buying cassette recorders to help those with reading problems. The Education Convener, Mrs. Christine Armour, of **Clarendon** in her report stated "education wants more emphasis on learning about other ethnics."

The **Pontiac** County Institute Convention is to be held at Stark's Corners. They have also invited the **Clarendon** ladies to be their guests at the May meeting. Among the branches that are preparing handi bags are **Shipton, Richmond Hill, Melbourne Ridge, Gore, Dennison Mills, Clarendon, Cowansville, Dunham, and Hemmingford**. Three members from **Richmond Young Women** catered for the Mosquito Hockey Tournament; in four days they fed 1,036 boys. At their March meeting there was a demonstration on broomstick lace. Another branch, **Dennison Mills** started their meeting off with a potluck supper with Mrs. Parkes, County President, as a guest. A large box of used Christmas cards and postage stamps are being sent to Kenya and a box of old and broken jewellery is being prepared to be sent to the older mental patients at St. Thomas, Ontario. Three members from **Cleveland** report perfect attendance. **Melbourne Ridge** WI have two new members and report four members with

perfect attendance. The citizenship convener for **Shipton** branch said that the Centre of Community Services was setting up a clinic at Danville. It will be an immunization clinic for the public in general, and it should benefit all citizens, especially the senior citizens. Two WI members from this branch are on the committee of this clinic.

At **Dunham** a dessert card party was planned with proceeds going to Camp Garagona, a local camp for mentally retarded children. **Waterloo-Warden** and **Granby West** each voted \$15 to the same camp. **Waterloo-Warden** welcomed a new member. At **Granby Hill**, to answer the roll call each member brought in a food item to be auctioned at the end of the meeting to raise money. The publicity convener at **Granby West** said that all meetings and activities will be printed in the local bilingual newspaper, La Nouvelle Revue, and the citizenship convener for the same branch said she had collected 37,560 bread clips. **Aubrey-Riverfield** held their meeting at Little Denmark Flower Shop. Mr. Jacobsen and staff answered questions concerning the care of house plants and demonstrated how to make a flower centrepiece. Each visitor went home with two daffodils. There was a display of pressed glass at the **Howick** meeting, and a talk on glass by Mrs. Brisbane was the highlight of the meeting. Pieces of old glass may often be found in unusual places as well as at auctions. A table was heaped with various items at the **Ormstown** meeting and each member told about her particular article. Some of these were Mme. Benoit's latest cookbook, autographed by the author, a map of New Zealand, a stone and shell vase from Gaspé, a much-prized mother's watch, old fashioned glasses, old book of correct behaviour, a souvenir from Mexico, Grandma's pillow shams, and pieces of old china all valued by their owners.

The convener of agriculture for **Hemmingford** reported that 74

children of the local elementary school have orders already for seeds which they will receive in time to plant their gardens. The publicity convener, same branch, reported a tribute to our Sister organization, the American Homemakers Club, by the FWIC of one dozen roses to be planted at the entrance to the Peace Gardens. The WI and UCW planned a Centennial Fashion Show for May 18 with members urged to dress in old-style costumes. The branch awarded a Centennial Bursary of \$50 in honour of 100 years of Incorporation of the Village of Hemmingford and this will be awarded to a student graduating from Hemmingford, going to C.V.R., for the highest achievement and to further his or her education, for the year 1977. Mr. Beattie Barr, a member of the Hemmingford Centennial Committee spoke to the group on the activities that have already taken place in Centennial Year and what is going to take place during the remainder of the year. At **Sawyerville**, Mrs. Jean Gleazos spoke on natural foods and at **Bury** Mr. and Mrs. Duncan McLeod of Milan showed slides of their recent trip to the British Isles. At **Sawyerville**, 115 bunches of daffodils were sold in aid of the cancer society.

The publicity convener from **Pontiac** listed some interesting roll calls: The nicest thing that happened to you during the year; A place of interest within driving distance of your home; What your husband thinks of WI. There were a number of catchy mottoes: To be born a lady is an accident, to die one is an achievement (**Pontiac**). Many toil for a loaf when a slice will do (**Shipton**). Perhaps you have read some of the writings of Kahil Gibran, poet born in Lebanon. He was author of the best seller, "The Prophet". In one of his other writings, I came across this line: All can hear but only the sensitive can understand. One has to say it over a time or two before the meaning really sinks in.

Gladys C. Nugent
QWI Publicity Convener

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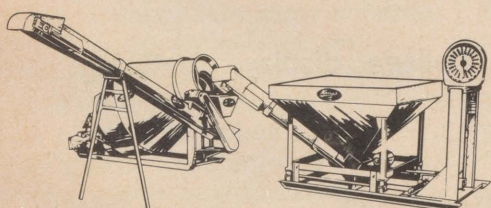
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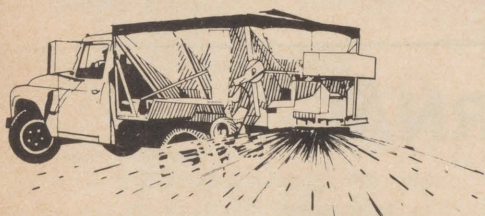


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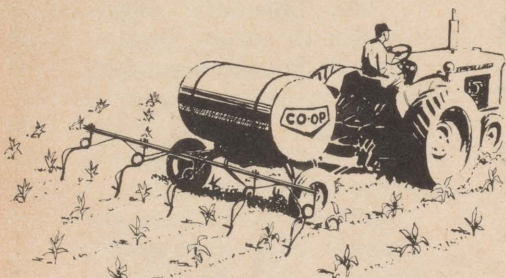
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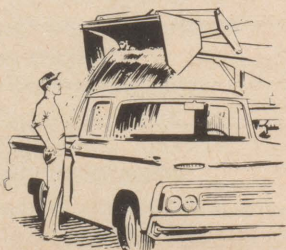


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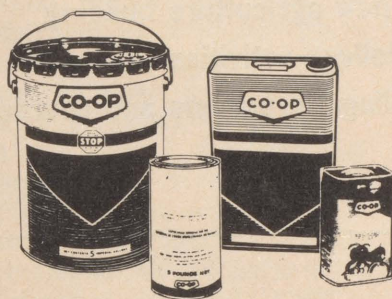


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